

tions of temperature to which it is subjected have no influence on the phenomenon?

This form of barometer is found everywhere in English-speaking countries under the names of "the farmers' weather glass," "the domestic barometer," or some other equally misleading title. In some forms that the Editor has tested, there is scarcely any apparent change in the clearness of the liquid, year after year. In other instruments, the crystals of camphor assume different forms, from day to day, which are certainly very interesting to observe and study, but have nothing to do with the weather and storms, and even less than one would expect, with the current temperature. To the meteorologist and farmer, these instruments have no value, but to the student of molecular physics, they are well worth an investigation.

The gas in the space above the liquid being a mixture of air and vapor of alcohol exerts a very variable pressure upon the liquid below; the latter is saturated with the three chemicals above mentioned, but as its temperature and pressure vary, it alternately rejects and absorbs a slight surplus of camphor. The rapidity with which this change takes place appears to decide the question as to the crystalline or fibrous structure of the visible cloud. Nearly all the changes in the appearance of the camphor cloud seem to depend upon the rate at which the changes of temperature take place, and the time that is given to the solid to collect into larger crystals and settle to the bottom or rise to the top, according to the relative density of different parts of the liquid. The ascending and descending currents going on within the liquid are slow and barely appreciable, but must have an effect upon its cloudy appearance.

AN OBJECTIONABLE NEW METEOROLOGICAL TERM.

The Weather Bureau does not adopt a new term or modify the usage of old terms until such change has come to have a well established meteorological and scientific use. Its own publications can only be made intelligible to its readers by a mutual agreement that each party adopt standard English both as to grammar and dictionary. Thus, when we predict a hurricane, it is not to be questioned that we mean an extensive, destructive storm of wind, and we do not mean a thunderstorm or a tornado, or even, necessarily, a heavy rain. When we predict thunderstorms or tornadoes, we do not mean cyclones or hurricanes or general windstorms or dust whirls. When we predict blizzards, we do not mean "snow tornadoes." This last expression is the newest addition to the sensational or Dolly Varden system of nomenclature that finds favor with some popular writers. So far as we know it first appeared in the *North American Review* for January, 1899, page 121, where it is used by Dr. F. L. Oswald without any special definition, as though it were a term familiar in every day use. He applies it to the front of a blizzard "that flies 400 miles farther south before it gets finally arrested for trespass on the reservation of the actual Tropics." He speaks of "the snow tornadoes that sweep from the polar regions to the very gates of the Tropics as distinctly an American institution as * * *," and again, of "the much maligned snow tornadoes that traverse a bee line route equaling the distance from northernmost Norway to the center of the Sahara." From these three expressions we judge that the snow tornado is equivalent to what is known in America as the blizzard and in Russia as the buran.

The combination of snow and high wind, followed by very low temperatures, that constitutes the blizzard, has no right to be called a tornado. The violence of the wind does not in the slightest degree approach that of a tornado or even that of a well-developed hurricane. The wind of the blizzard is

a straight-line, horizontal wind, sometimes rolling back on itself; the wind of the tornado has a steep ascent and something of a whirl round a vertical axis. In the tornado a sudden barometric depression occurs and the air within a building expands outward and tears the building to pieces; in a blizzard there is no conspicuous fall in pressure, but a rapid rise as soon as the wind strikes the station. The tornado occurs in warm weather and has its origin in a cloud immediately above the station; the blizzard occurs in cold weather and has its origin in a very extensive mass of cold, dry air.

Snow whirls, like dust whirls, have nothing tornadic in their nature or origin; they occur in connection with blizzards, but do not convert the blizzard into a tornado.

One might as well speak of a tornado as a "warm-air blizzard" as to call a blizzard a "snow tornado," and we hope that neither expression will take hold of the popular fancy. The words blizzard and cold wave have come into recognized popular and scientific use since the Weather Bureau was established in 1870; they were expressive and frequently needed as convenient terms for daily use, but we hardly see the necessity for this newest term. We are curious to learn whether there is any locality where the term "snow tornado" is in use.

For the present the MONTHLY WEATHER REVIEW will continue to use the words hurricane, typhoon, cyclone, low pressure, high pressure, thunderstorm, tornado, and blizzard in their well-recognized scientific meanings.

WEATHER BUREAU MEN AS UNIVERSITY LECTURERS.

Many of our colleges and universities have, during the past twenty years, expressed a desire to secure instructors in meteorology, but have expressed regret that funds are not available for the establishment of full courses of instruction in the subject.

Fortunately, however, among the Weather Bureau officials may be found many who are willing to devote a portion of their time to the instruction of young men, and occasionally the employees of the Bureau receive invitations to deliver courses of lectures that must, eventually, as we fondly believe, lead to the full recognition of meteorology as an important branch of study.

The latest action in this respect has been that taken by the Board of Regents of the University of California, on June 16, when Mr. Alexander McAdie, Forecast Official of the Weather Bureau, was appointed "Honorary Lecturer on Meteorology, in the University, for the academic year 1899-1900." Prof. A. O. Leuschner, at the head of the department of civil engineering and astronomy, upon learning of this appointment, added: "I hope that we may now succeed in building up a department of meteorology in the University." We can not doubt but that many students of the subject will listen to Mr. McAdie's course of lectures, and that much good will be done thereby, but if a department of meteorology is to be built up in the University it must be done by the consecration of one's whole time and energy to that work, as is shown by the pioneer work done in this line by Prof. Wm. M. Davis and R. DeC. Ward, at Harvard University.

We notice that by a recent decision of the faculty of Harvard, meteorology has been placed on the list of subjects that may be offered for examination by young men who desire to enter the freshman class of that institution. This is in accord with the growing tendency to introduce the study of elementary meteorology into the high schools and preparatory collegiate academies of the country.

During the past year Dr. O. L. Fassig has not only completed his own studies for the degree of Ph. D., being the

first one in America to receive that degree from an American university for work done in meteorology, but has also carried on a course of thirty lectures on climatology before the graduate students in the department of geology in Johns Hopkins University. He has also given lectures to the teachers of the public schools of Baltimore. During the coming year it is expected that the lectures to university students will be continued and a still more extensive course on climatology will be given to the teachers of the city. The recent efforts of this university to reach the teachers of public schools in Baltimore, though the lectures by Drs. Fassig and Shattuck have been remarkably successful and one might suggest that an effort be made, in a similar way, to reach the teachers in the whole State of Maryland.

Why should not the State Normal schools and similar organizations engage Weather Bureau men to carry on systematic instruction in meteorology? The Editor is often asked to recommend a good text-book. Why may he not also have an opportunity to recommend a good lecturer? Such talks as are given by many of our observers would, we are sure, be a welcome and popular addition to the courses of instruction in summer schools and other places where the teachers are accustomed to congregate, and where they get new ideas and advanced methods in school work.

THE CONFLICT OF MAN WITH THE CLIMATE.

A correspondent inquires whether plants have any influence upon climate, and complains that the destruction of pine forests in southern Alabama seems to have produced disastrous droughts, and that the climate has entirely changed in that section. The following extracts from the Editor's reply are applicable to occasional similar complaints from other parts of the country:

You will find much information as to the influence of trees upon climate in Bulletin No. 7 of the Forestry Division of the Department of Agriculture. As to the general influence of vegetation upon the weather, this matter has been discussed in a popular and indefinite manner for many generations, but the technical or scientific discussion has long since been abandoned, as it is certain that the influence of vegetation upon the weather is quite inappreciable. Our weather at the ground depends upon the clearness of the sky, and that depends principally upon the clouds, which in turn depend upon the moisture in the air. The fundamental question is whether the air is ascending to make clouds or descending to make clear, dry weather, or whether moist air will cool by radiation and form a temporary fog during the night.

With regard to any possible injurious change in the amount of rainfall or in the climate in your locality, which seems to be the feature that you especially refer to, I would say that the records of the past century do not support the idea that there has been any permanent change. Everywhere throughout the globe the rainfall is subject to great variations as to its amount and the manner in which it falls; sometimes at night and sometimes by day; sometimes in many little showers and sometimes in a few heavy floods; sometimes droughts in summer and rains in winter; at other times rains in summer with dry winters, but no steady secular changes are known. The oscillations are so frequent and sometimes so extreme that they set at naught all attempts to foresee them. In general, droughts that really injure vegetation are not confined to small regions, but extend over half a continent, and may move slowly but regularly around the whole globe in the course of two or three years. The injury done by a drought is due, not so much to the lack of rain as to the drying influence of the air and the wind. Often there is enough moisture in the soil, down to depths of 3 to 6 feet, to supply all the needs of vegetation during a year's drought, provided only it can be properly conserved; but, in fact, it rises to the surface and is wasted by the drying wind, in place of being utilized by the plant. Prof. Milton Whitney, Chief of the Division of Soils, has pointed out regions in California where such great amounts of moisture are stored away in the deep soil and such admirable conditions exist in the surface soil that the moisture is conserved indefinitely and the plants thrive without either rain or artificial irrigation.

Inasmuch as we know that droughts and floods, storms and frosts must have frequently occurred in any given locality, therefore, when we cultivate the land and plant our crops, we do so in full knowledge

of the impending chances of disaster, and have no right to expect uninterrupted immunity and prosperity. Never in the history of the world has it ever been possible for any one to carry out to successful completion his schemes and plans without an intense struggle against all forms of opposition. In this struggle it is not so much the strongest will as it is the highest intellect that succeeds. In the course of time almost every one, by studying his own surroundings, learns enough to enable him to achieve a moderate amount of success in any new enterprise. So far as the weather is concerned, the Weather Bureau will send you the earliest possible predictions, so that you may take precautions against injury from wind or flood or frost.

Man is so constituted that, although individuals may fail, yet the race, as a whole, is being steadily improved and developed by its conflict with nature.

WIDESPREAD AREA OF DROUGHT OR COLD.

In connection with the severe winter and spring of 1899, the editor of the Boston Journal (April 8) calls attention to the curious psychic phenomenon that in New England the belief that the climate had become milder has now changed about, and old inhabitants are inclined to acknowledge that the old-fashioned winters have come back again. On the other hand, in the Southern States the popular belief is that the climate has suddenly become more severe, forgetting that equally severe winters have occasionally occurred in that section ever since the country was first settled. We must, therefore, conclude that there has been no change in the average climate of either the northern or southern regions.

The Editor would call attention to the fact that in the South the severe winter of 1835 was preceded and followed by other winters of extraordinary harshness, and so was the memorable winter of 1886 and that of 1894-95, and so finally that of 1898-99. It might almost be accepted as a rule that the severest winters are but the climaxes of periods of unusual refrigeration. Between these cold periods come the warm years.

In the MONTHLY WEATHER REVIEW for 1896 we several times called attention to the fact that a disastrous drought is usually the result of the cumulative effect of several years of light rain or drought; also that such droughts are not confined to a small region, but move slowly during several years over the face of the globe. The gradual spread of the great cloud of vapor and dust ejected from the volcano of Krakatoa in July, 1884, lasted for several years. During the first few months it quickly surrounded the globe in the equatorial region, then it spread slowly north and south until its influence was felt in latitude N. 60° and S. 50°. One can but suppose that this demonstration of the gradual overflow of vapor in the upper regions from the equator toward either pole also applies to frequent analogous overflows of hot air, electrified air, and possibly other meteorologic elements. If this hypothesis be allowable, it will be worth while to seek for many diverse confirmations of the general rule that at any place throughout the globe any remarkable period of warm or cold, dry or wet weather is but the culmination of a series of less remarkable phenomena of the same character. This idea can be best tested by a series of daily maps like those of the Bulletin of International Simultaneous Meteorological Observations, or by the monthly maps that Professor Hildebrandson has prepared. Such studies must lead to seasonal forecasts on a correct basis of observation and induction.

RAINFALL AT HIGH STATIONS.

The hydrographer to the United States Geological Survey, Mr. F. H. Newell, as also his assistant, Mr. Henry A. Pressey, desire to call attention to the fact that inasmuch as Weather Bureau stations of all kinds are generally located in river